ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER
MODEL DX-7500

Black model

BUDN, BUD	120V AC, 60 Hz
BUG	220V AC, 50Hz
BW, BWX	120/220V AC, 50/60 Hz
BUQA, BUQB	240V AC, 50 Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

SPECIFICATIONS

Signal readout system:	Optical non-contact
Reading rotation:	About 500~200 r.p.m. (constant linear velocity)
Linear velocity:	1.2~1.4m/s
Error correction system:	Cross interleave readsolomon code
Decoded bits:	18 bits linear
Sampling frequency:	352.8kHz (eight-times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5Hz~20kHz
Total harmonic distortion:	0.0015% (at 1kHz)
Dynamic range:	103dB
Signal to noise ratio:	110dB
Channel separation:	103dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Power consumption:	23 watts
Output level:	2 volts r.m.s.
Dimensions (W×H×D):	435×131×365 mm 17-1/8"×5-1/8"×14-7/16"
Weight:	8.8kg, 19.4 lbs.

Specifications are subject to change without notice.

ONKYO
AUDIO COMPONENTS

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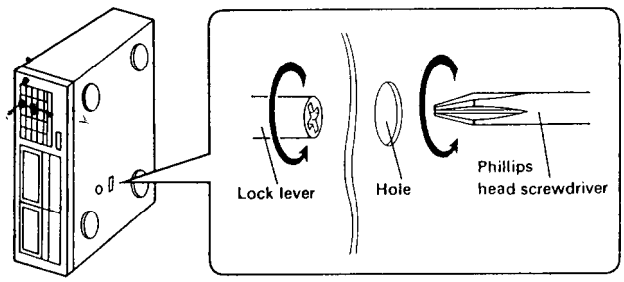
SERVICE PROCEDURES

1. How to Release the Transport Lock

To protect the optical assembly including the laser pickup from vibration related damage during shipping, this unit is equipped with a transport lock lever located on the base.



- Use a screwdriver to turn the lock lever (about 90°) in the round hole in the direction of arrow (C).
- Before transporting the unit again, stand it with its left side facing down, and turn on the power. Wait 2-3 seconds and then turn the lock lever in the opposite direction of the arrow.

Fig. 1

2. Safety-check out

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cable and chassis.

Specifications: more than 10Mohm at 500V.

3. Procedures for replacement of flat packaged ICs

1. Tools to be used:

(1) Soldering iron . . . . Grounded soldering iron or soldering iron with leak resistance of 10 Mohms or more.

Form of soldering iron's tip:

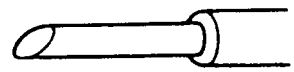


Fig. 2

(2) Magnifying glass . . . for checking of finished works

(3) Tweezers . . . . . for handling of IC and forming of leads

(4) Grounding ring . . . . Countermeasure for electrostatic breakdown

(5) Nipper . . . . . for removing defective IC

(6) Small brush . . . . . for application of flux

2. Work Procedures:

(1) Remove the defective IC

Cut all leads of the defective IC one by one using a nipper and remove the IC.

(2) Clean the pattern surface of the PC board.

Get rid of the remaining leads and solder.

(3) Check and from the leads of the new flat packaged IC to be installed.

From every lead on the new IC using a pair of tweezers, so that all of them are aligned neatly without being risen, twisted or inclined toward one side. Especially the rising portion of every lead must be formed with greatest care.

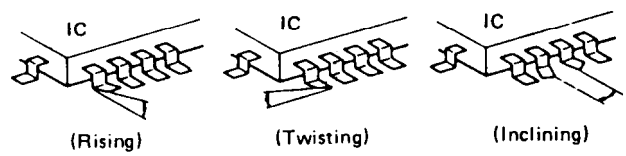


Fig. 3

(4) Apply flux to the PC board.

Apply flux to the pattern surface of the PC board which has been cleaned, as shown in the illustration. The area to be applied with flux is the portion of about 2.5mm in width where the IC's leads are to be soldered.

Be careful to apply minimum amount of flux required so as not to smear it on unwanted areas.

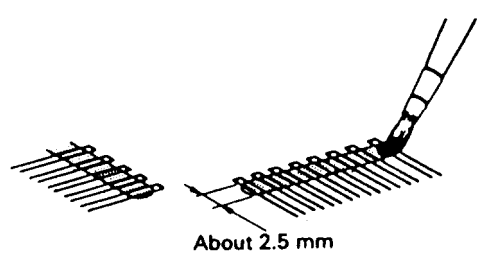


Fig. 4

(5) **Temporarily tighten the IC**

Carefully align the pattern and IC's leads, so that the IC will be temporarily tightened to the pattern on the four leads at the corners. At this time, soldering is required, but no need to apply soldering material.

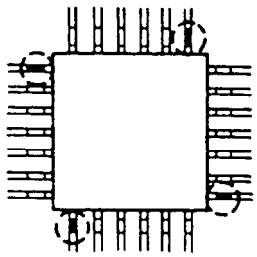


Fig. 5

(6) **Apply flux to IC's leads**

Apply flux to the areas of IC's leads where soldering is to be performed. Be careful not to smear flux on the root portion of any lead or the body of IC.

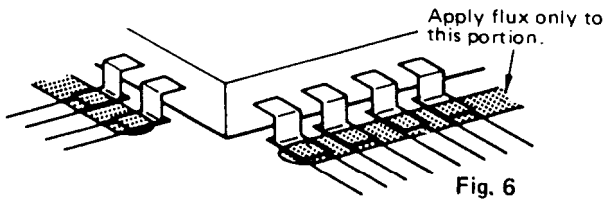


Fig. 6

(7) **Soldering**

While attaching the tip of the soldering iron to the soldering point as shown in the illustration, feed 2 –5mm of soldering wire. Then, slowly move the iron in the direction indicated by the arrow in the illustration, so that the leads will be soldered to the pattern. Move the iron in the rate of approximately 1cm in 5sec. Proceed with your work while confirming a clean fillet of solder is formed on each lead, subsequent to the melting of flux.

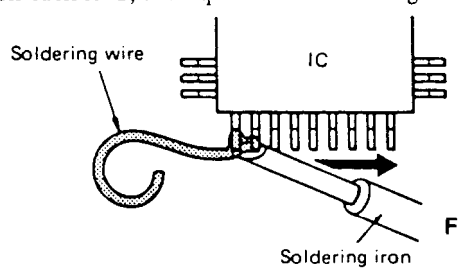


Fig. 7

CAUTION

1) If you move the iron too quickly, loose soldering is likely to result.
2) Be especially careful when soldering the first lead where loose soldering is most liable to be formed.

(8) **Check the results**

When soldering of all leads is finished, check the soldered portion on every lead with a magnifying glass. A tester must not be used or checking of any soldered position

NOTE ON COMPACT DISC

- **Holding Compact Discs**

Hold Compact Discs by the edges so that you do not touch the surface of disc. Remember that the side of the disc with the "rainbow" reflection is the side containing the audio information.

Do not attach tape or paper to the label side of the disc and always be careful not to leave fingerprints on the side that is played.

- **Storing Compact Discs**

Store Compact Discs in a location protected from direct sunlight, high heat and humidity and extremely high and low temperatures. Discs should never be left in the trunk or interior of an automobile in the sun since the temperature can become very high in such a closed environment.

Always store Compact Discs in the holders in which they were sold. Never leave a disc in the player's disc holder for a long period of time.

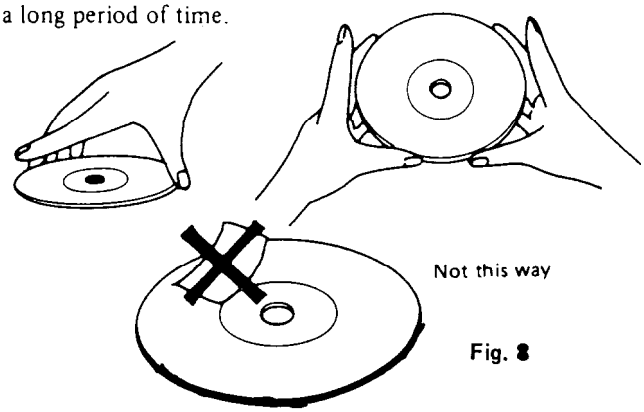


Fig. 8

- **Cleaning Compact Discs**

Before playing a disc wipe off the playing surface with a soft cloth to remove dust and other soil. Wipe the surface in straight lines from the center of the disc outward, not in a circular motion as you would with a phonograph record.

Do not use benzene, chemical cleansers or phonograph record cleaning solutions to clean Compact Discs. Also avoid static electricity prevention solutions since they can damage the surface of Compact Discs.

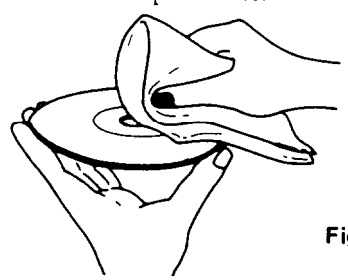


Fig. 9

Problems Caused by Dew

Dew can form inside a Compact player when it is brought from a cold environment into a warm room, when a room is rapidly heated and if a player is left in a humid environment.

This dew can prevent the laser pickup from reading the data contained in the pits in the disc surface. If the player does not operate properly because of dew, remove the disc and leave the player's power switch on for about one hour to remove all moisture.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMMISION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

Laser Diode Properties

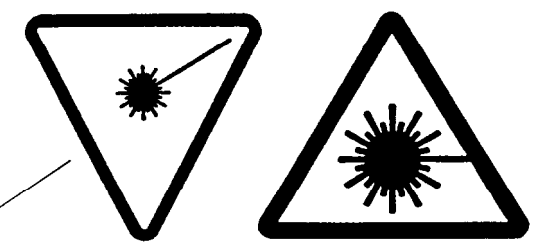
- Material: GaAS/GaAlAs
- Wavelength: 780nm
- Emission Duration: continuous
- Laser output: max. 0.5mW*

*This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

LASER WARNING LABEL

The label shown below are affixed.

1. **Warning label**



DANGER —INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION —HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED.

ATTENTION —RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L'ECLENCHEMENT DE SECURITE ANNULE.

SN29360911

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAF-BRYDER ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

Photo 1

2. Certification label (UD: 120V model)

This label is located on the back panel.

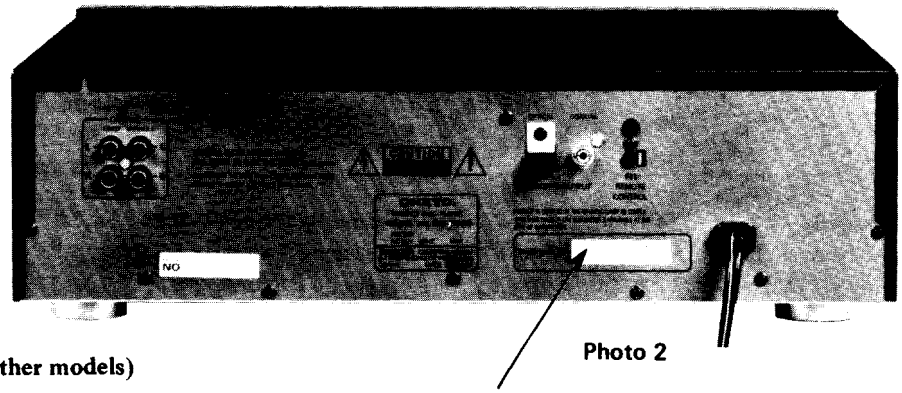


Photo 2

3. Class 1 label (Other models)

This label is located on the back panel.

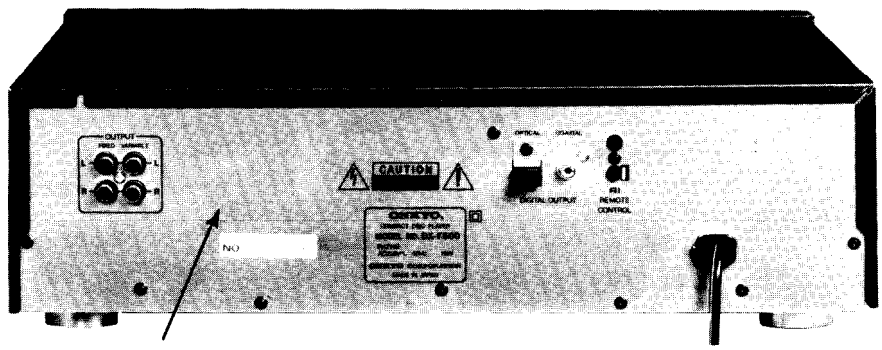


Photo 3

ADVARSEL

"CLASS 1 LASER PRODUCT"

Denne mærkning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilladelig kraftig stråling.

APPARATET BØR KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

Indvendigt i apparatet er anbragt den her gengivne advarselsmærkning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.

ADVARSEL USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAF BRYDER ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING

VAROITUS! Laite sisältää laserdiodin, joka lähettää (näkymätöntä) silmille vaarallista lasersäteilyä.

Fig. 10

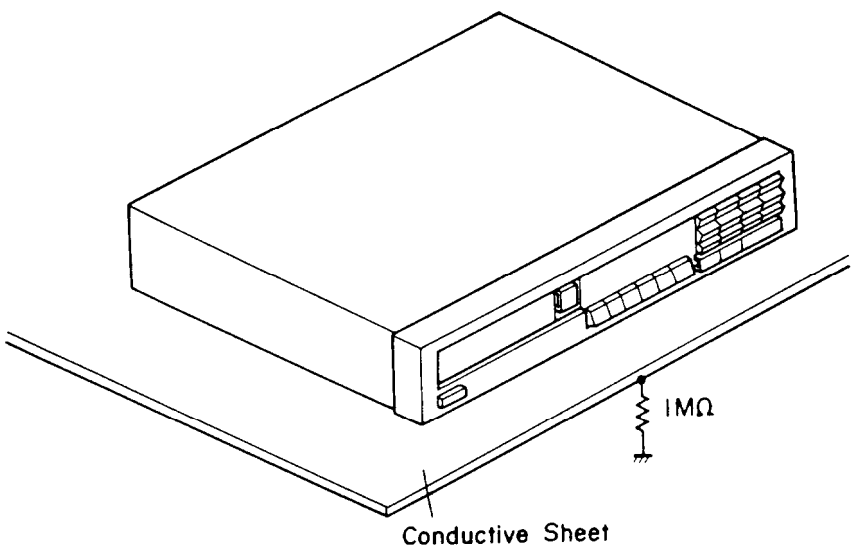
CAUTION ON REPLACEMENT OF PICKUP

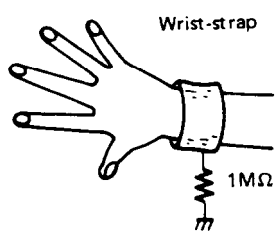
The laser diode in the optical pick-up block is so sensitive to static electricity, surge current and etc. that the components are liable to be broken down or its reliability remarkably deteriorated.

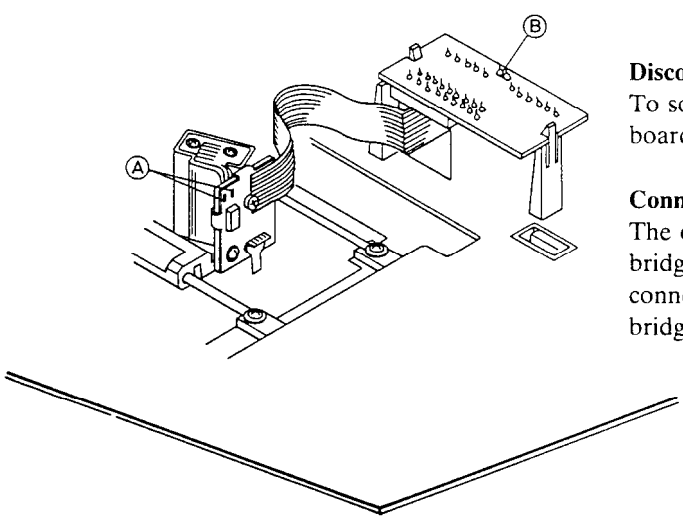
During repair, carefulley take the following precautions. (The following precautions are included in the service parts).

PRECAUTIONS

1. **Ground for the work-desk.**
   Place a conductive sheet such as a sheet of copper (with impedance lower than $10^6\,\Omega$) on the work-desk and place the set on the conductive sheet so that the chassis.
2. **Grounding for the test equipment and tools.**
   Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.
3. **Grounding for the human body.**
   Be sure to put on a wrist-strap for grounding whose other end is grounded.
   Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.
4. **Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.**
5. **Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.**





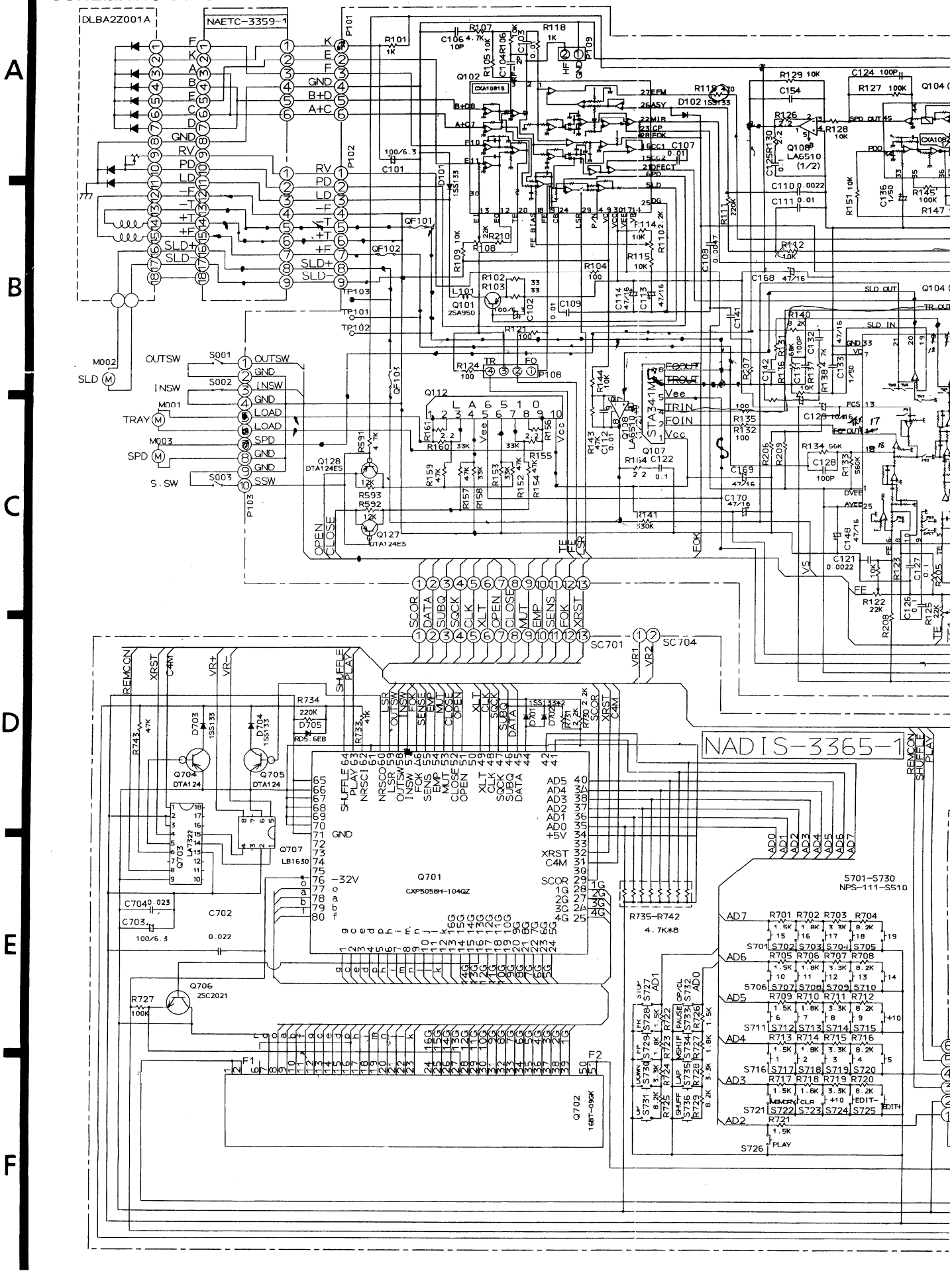


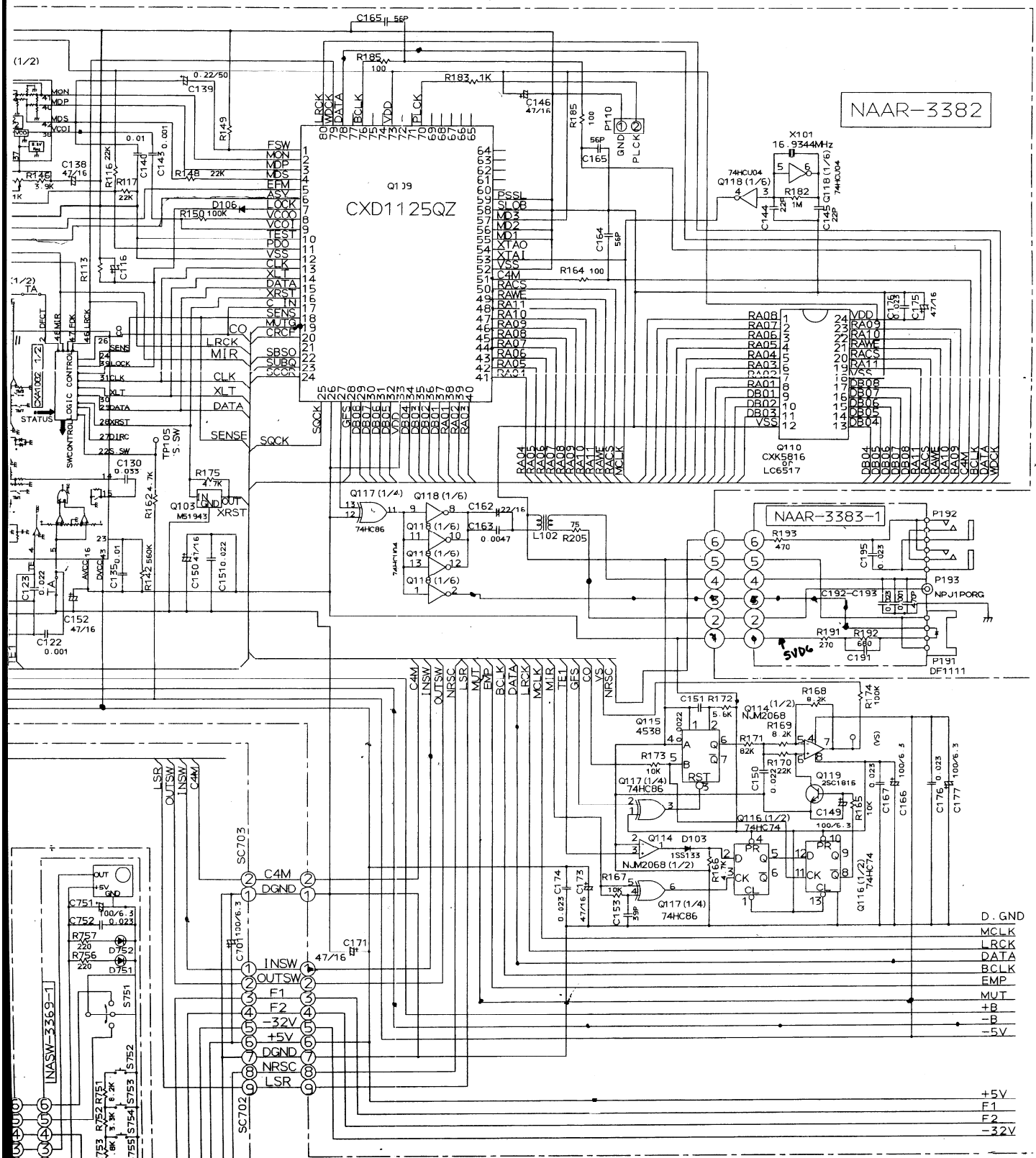
Disconnection
To solder Ⓐ position and Ⓑ position on the terminal PC board before removing the optical pickup.

Connection
The optical pickup of service part has a protective solder bridge for Ⓐ position. That must be removed after connecting the pickup. Then, remove a protective solder bridge for Ⓑ position.

Fig. 11

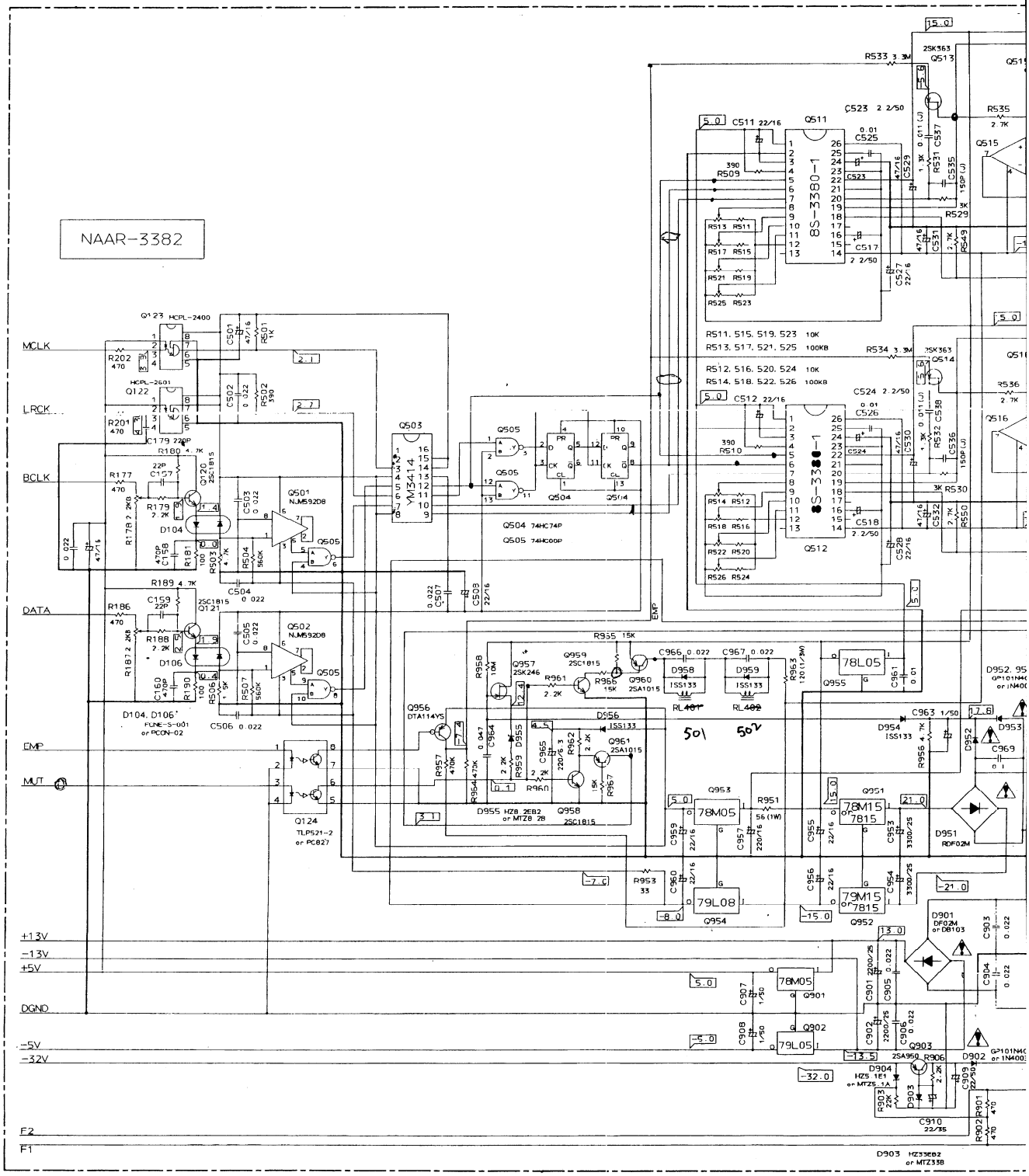
SCHEMATIC DIAGRAM



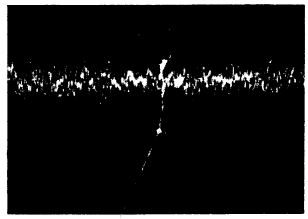


- ALL RESISTORS ARE IN OHMS 1/4WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF/50wV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M) MEASURED WITH ▭ V IS DC VOLTAGE. (NO INPUT)
- THE CONPONENTS IDENTIFIER ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

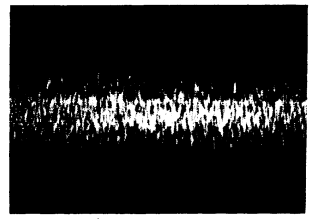
SCHEMATIC DIAGRAM



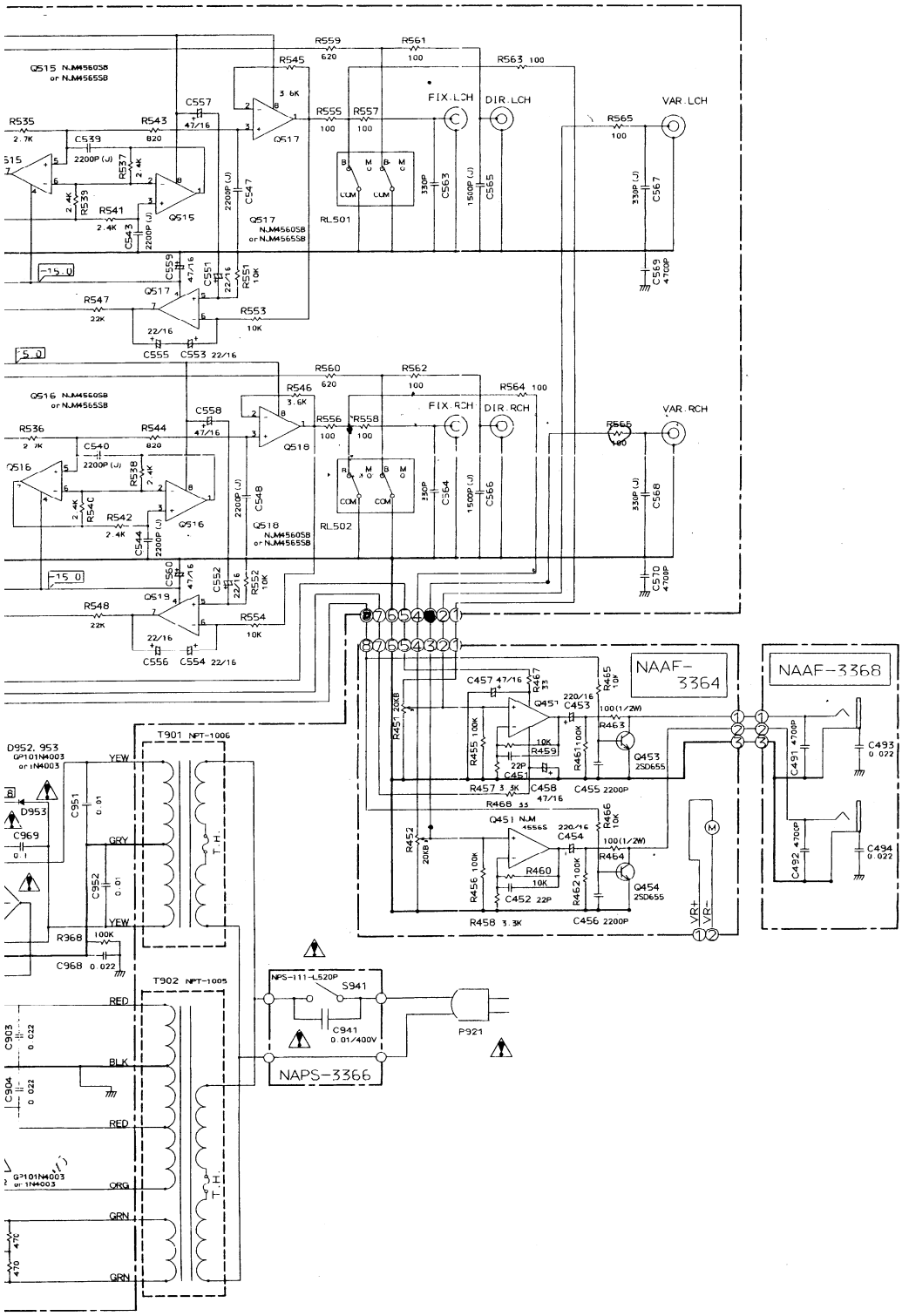
TP RF (RF signal)
Vertical : 1V/div.
Holizontal : 1 ms/div.
DC, Ground: Center

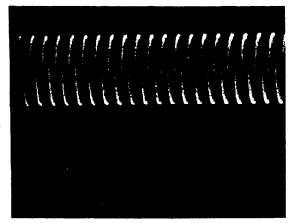


TP FO (Focus out)
Vertical : 0.5V/div.
Holizontal : 0.5 ms/div.
DC, Ground: Center

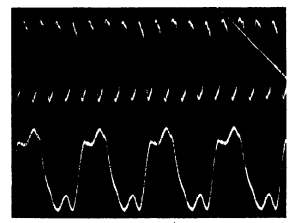


TP TO (Tracking out)
Vertical : 0.2V/div.
Holizontal : 0.5 ms/div.
DC, Ground: Center

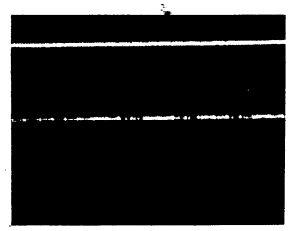




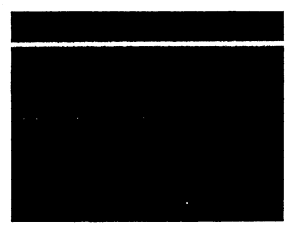
P110 PLCK
Vertical : 0.5V/div.
Holizontal : 0.2 μs/div.
DC, Ground: Center



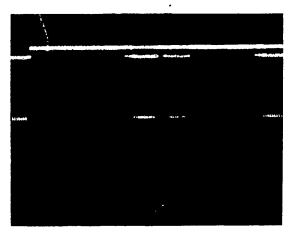
Vertical : 2V/div.
Holizontal: 0.1 μs/div.
X'tal (Q118 Pin 4)/C4M (R164)
AC



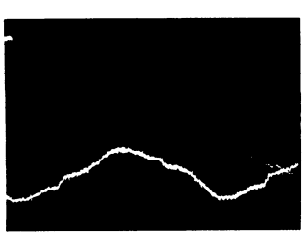
DATA (Microprocessor)
Vertical : 2V/div.
Holizontal : 0.5 ms/div.
DC, Ground: Center



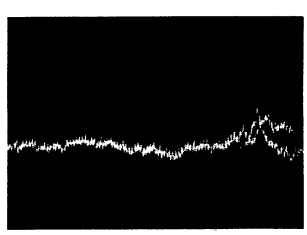
XLT
Vertical : 2V/div.
Holizontal: 0.5 ms/div.



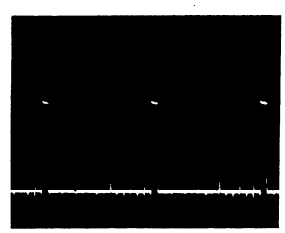
CLK
Vertical : 2V/div.
Holizontal : 50 μs/div.
DC, Ground: Center



TP SLD (Slide out)
Vertical :2V/div.
Holizontal :20 ms/div.
Top :Real
Bottom :Storage

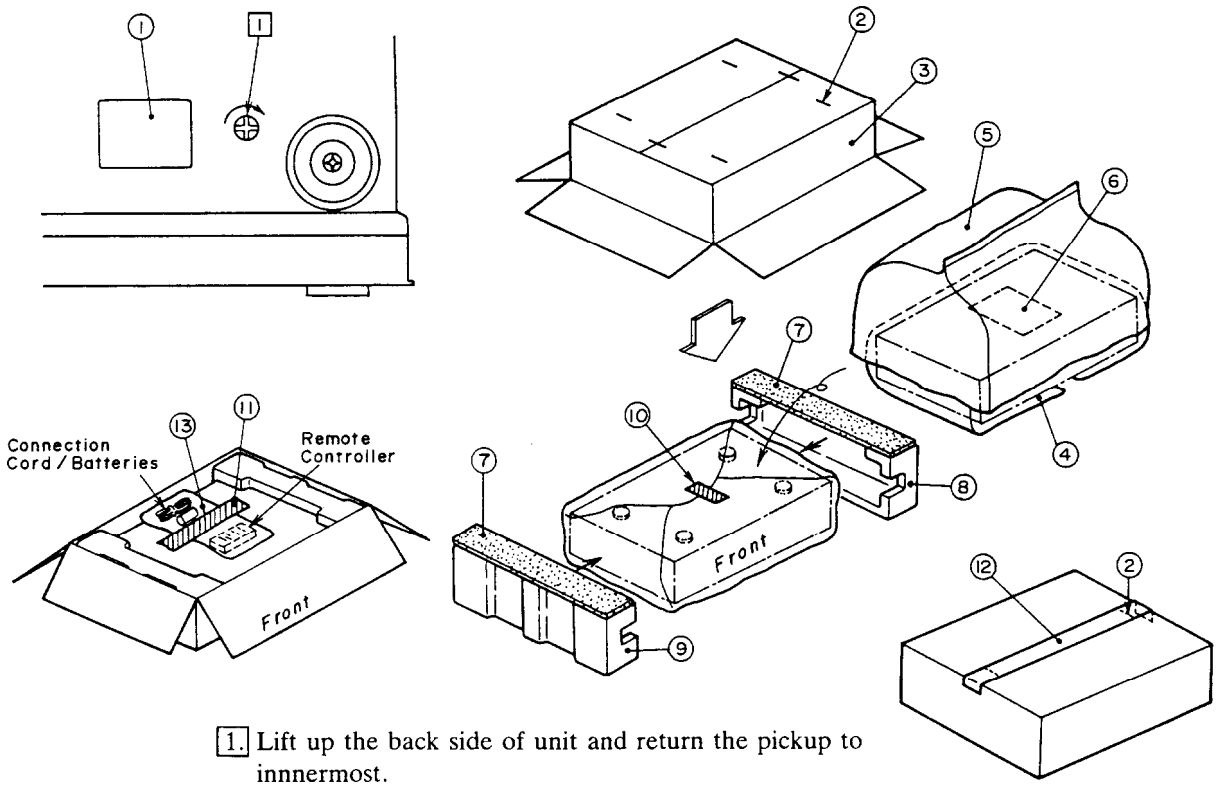


TP SPD (Spindle out)
Vertical : 1V/div.
Holizontal : 5 ms/div.
DC, Ground: Center



Grid
Vertical : 10V/div.
Holizontal : 1 ms/div.
DC, Ground: Center

PACKING VIEW

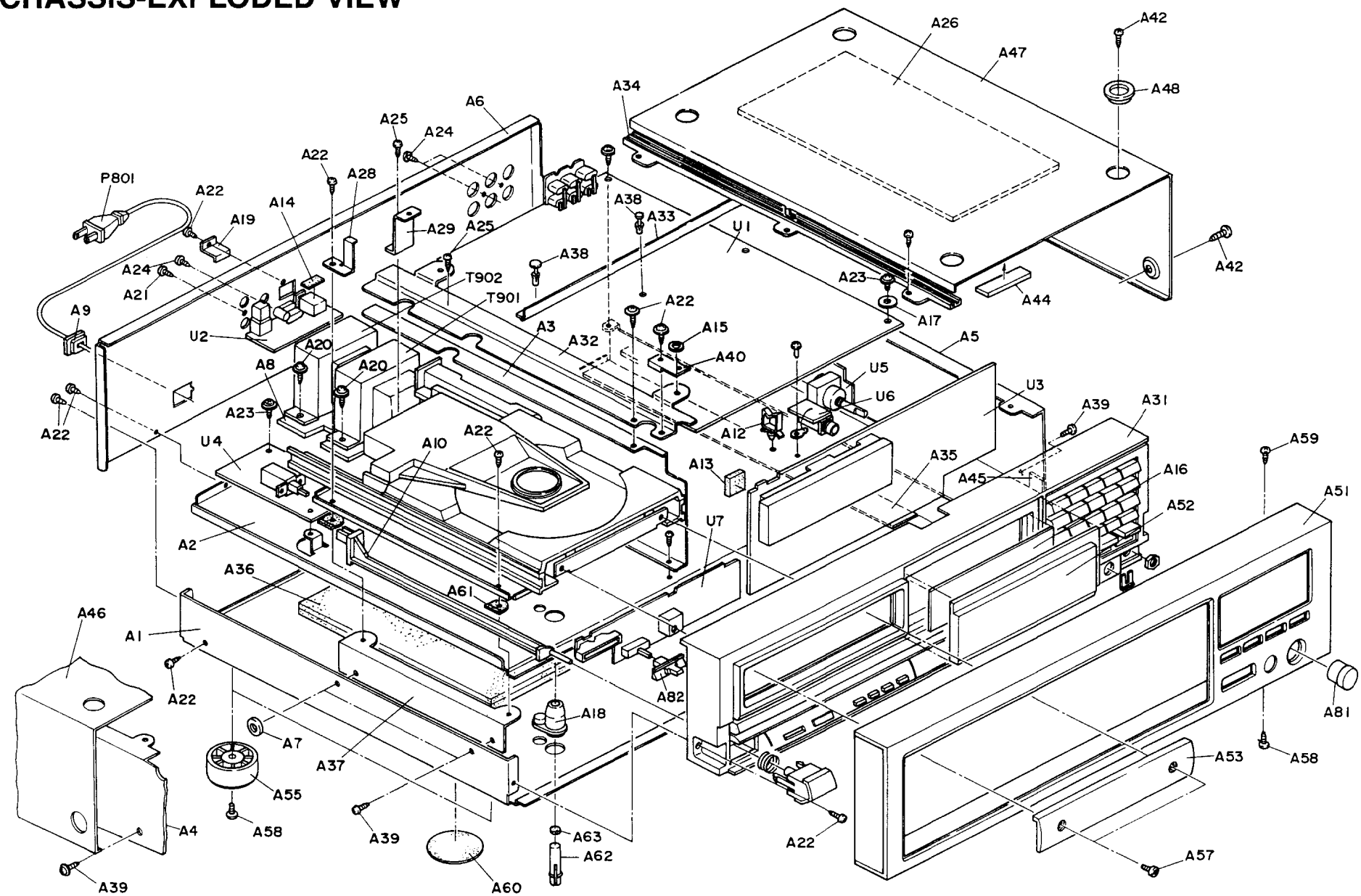


1. Lift up the back side of unit and return the pickup to innnermost.
   Use a screwdriver to turn the lock lever (about 90°) in the round hole in the direction of arrow. (Clockwise)

REF. NO.	PART NO.	DESCRIPTION
1	29361123	Label
2	282301	Sealing hook
3	29051759	Master carton box
	29051762A	Master carton box ⟨PX⟩
4	29095012-1	500×800mm, Protection sheet
5	29100105	550×680mm, Poly-vinyl bag
6	29355153	Caution label
7	29095572	Sheet
8	29091264A	Pad L
9	29091265A	Pad R
10	261504	Adhesive tape
11	29110071	Damplon tape
12	260012	Damplon tape
13		Accesarry bag ass'y
	29341301	Instruction manual ⟨D/PX⟩
	29341348	Instruction manual ⟨G/U⟩
	29341304	Instruction manual, Italian ⟨G/U⟩
	2010166	Connection cord
	24140028	RC-122C, Remote controller
	3010054	UM-3, Two batteries
	2010169	Cord RI
	29365019	Warranty card ⟨N⟩
	29365021	Warranty card ⟨PX⟩
	29358002F	Service station list ⟨N/PX⟩
	25055040	CV-K-2, Conversion plug ⟨U⟩
	25055251	CV-CP, Conversion plug ⟨PX⟩
	29100097	Poly-vinyl bag
	29091309	Pad, tray panel
	29095572	Sheet, tray panel

NOTE: ⟨D⟩: Only 120V model
⟨G⟩: Only 220V/240V models
⟨U⟩: Only worldwide model
⟨PX⟩: Only PX model
⟨N⟩: Only U.S.A. model

CHASSIS-EXPLODED VIEW



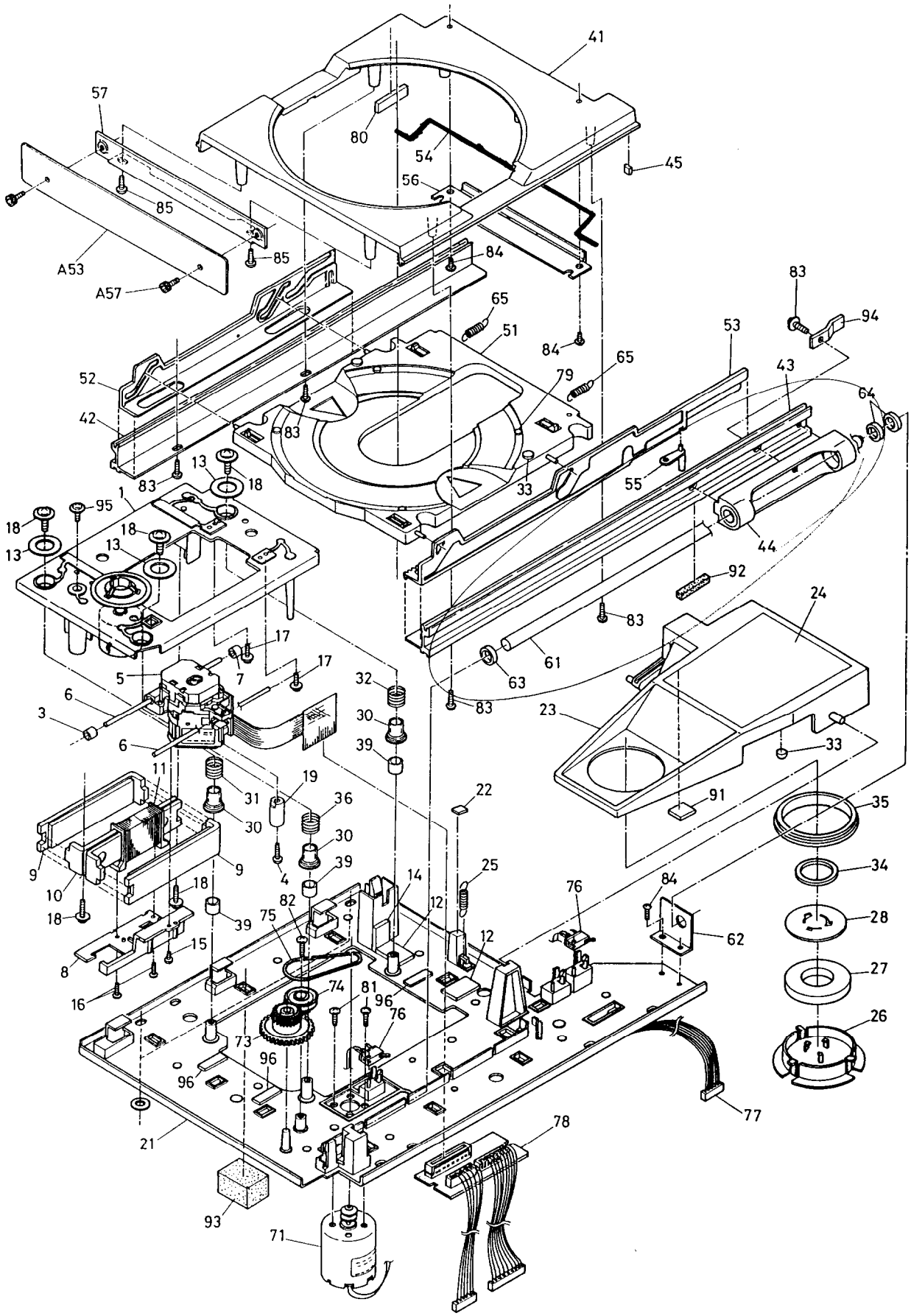
PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A1	27100170A	Chassis
A2	27100169	Chassis U
A3	27130542	Bracket C
A4	27130544A	Bracket L
A5	27130545	Bracket R
A6	27121167	Back panel ⟨D⟩
	27121168	Back panel ⟨G⟩
	27121169	Back panel ⟨W/PX⟩
	27121206	Back panel ⟨QA/QB⟩
A7	27175011C	Leg (Cushion)
A8	27270214A	Spacer
A9	27300750	⚠ Strainrelief
A10	27273101	Joint, power
A12	27300833	WS-2NS, Clamper
A14	27270278	Spacer
A15	27270212	Spacer
A16	28133202	Back plate
A17	870060	W3×15, Flat washer
A18	27267558-1	Guide
A19	27141281	Bracket
A20	830440109	4TTC+10C(BC), Tapping screw
A21	834430108	3TTS+10B(BC), Tapping screw
A22	834430088	3TTS+8B(BC), Tapping screw
A23	831130088	3TTW+8B, Tapping screw
A24	834230108	3TTS+10B(Ni), Nickel screw
A25	834430068	3TTS+6B(BC), Tapping screw
A26	28140904	Cushion
A28	27141310	Bracket, rail
A29	27141316	Bracket
A31	27110433	Front bracket ass'y
A32	27130546A	Bracket CR
A33	27130547A	Bracket PC
A34	27273090A	Joint, cover
A35	28140874B	Cushion
A36	28140875A	Cushion
A37	27130543B	Bracket L
A38	880009	Rivert
A39	838430088	3TTB+8B(BC), Tapping screw
A40	27141312	Bracket
A42	838440089	4TTB+8C(BC), Tapping screw
A44	28140408	t3×10×36, Cushion
A45	28140653	Cushion
A46	28184404A	Top cover L
A47	28184405A	Top cover R
A48	27265155A	Decoration ring
A51	1H053121	Front panel ass'y
A52	28191477	Clear plate
A53	27210987	Panel, door (Tray panel)
A55	27175153	Leg
A57	84643008	3HSB×8FN(BC), Special bolt
A58	834430088	3TTS+8B(BC), Tapping screw
A59	833430080	3TTP+8P(BC), Tapping screw
A60	27270255	Spacer
A61	27301187	Cushion L
A62	27301184	Lock pin
A63	28140918	Cushion
A81	28323433	Knob
A82	28323152	Knob MODE
P801	253112A	⚠ AS-UC-4#18, Power supply cord ⟨D/PX⟩
	253148 or 253150	⚠ AS-CEE 250V 2.5A, Power supply cord ⟨G/W⟩
	253118	⚠ AS-SAA, Power supply cord ⟨QA⟩
	253104	⚠ Power suuply cord ⟨QB⟩
S902	25065195	⚠ NSS-1288P, Voltage selector switch ⟨W⟩
T901	2300346	⚠ NPT-1005D, Power transformer ⟨D⟩
	2300347	⚠ NPT-1005G, Power transformer ⟨G⟩
	2300349	⚠ NPT-1005AG, Power transformer ⟨W/PX⟩
	2300348	NPT-1005Q, Power transformer ⟨QA/QB⟩
T902	2300350	⚠ NPT-1006D, Power transformer ⟨D⟩
	2300351	⚠ NPT-1006G, Power transformer ⟨G⟩
	2300353	⚠ NPT-1006AG, Power transformer ⟨W/PX⟩
	2300352	⚠ NPT-1006Q, Power transformer ⟨QA/QB⟩
U1	1H053582-1	NAAR-3382-1, Main circuit pc board ass'y ⟨D⟩
	1H053582-1A	NAAR-3382-1A, Main circuit pc board ass'y ⟨G/W/QA/QB/PX⟩
U2	1H053383-1	NADG-3383-1, Opto./digital output pc board ass'y
U3	1H048565-1	NADIS-3365-1, Display circuit pc board ass'y
U4	1H048566-1	NAPS-3366-1, Power switch pc board ass'y
U5	1H048567-1	NAAF-3367-1, Headphone amplifier pc board ass'y
U6	1H048568-1	NAAF-3368-1, Headphone terminal pc board ass'y
U7	1H048569-1	NASW-3369-1, Switch pc board ass'y
W1	260208	Binder

NOTE: ⟨D⟩: Only 120V model
⟨G⟩: Only 220V model
⟨W⟩: Only Worldwide model
⟨PX⟩: Only PX model
⟨QA⟩: Only Australian model
⟨QB⟩: Only British model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

MECHANISM-EXPLODED VIEW



PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
1	1H048901	Spindle motor ass'y
3	27270264	Spacer
4	82542010	2B+10F(BC), Binding screw
5	24110003	DLBA2Z2001A, Optical pickup
6	27260286	Shaft
7	27270264-1	Spacer
8	27301129B	Plate
9	28181020	Magnet ass'y
10	27301152	York ass'y
11	24502236A	Coil
12	28140912	Cushion A
14	28140914	Cushion C
15	82542006	2B+6F(BC), Binding screw
16	833420068	2TTP+6B(BC), Tapping screw
17	831430100	3TTW+10P(BC), Tapping screw
18	801414	Special screw
19	27301179	Weight PU
21	27100166C	Chassis L
22	28140891	Cushion A
23	27301131B	Arm
24	29360911	Label LASER 3
25	27180402	Spring
27	28181019A	Magnet CH
28	27301133	York CH
30	27301134	Cushion rubber
33	28140860	Cushion
34	27270277	Spacer
35	27301172	Cushion rubber
37	27301182	Cushion L
39	28140917	Tube
41	27301124	Disc tray

REF. NO.	PART NO.	DESCRIPTION
42	27301135	Rail L
43	27301136	Rail R
44	27301126	Guide bearing
45	28140892	Cushion T
51	27301137B	Disc plate
52	27301138	Cam plate L
53	27301139A	Cam plate R
54	27260280A	Shaft
55	27301140A	Stopper
56	27301141A	Plate
57	27141275	Bracket
61	27260281A	Shaft
62	27141274	Bracket
63	27270265A	Spacer
64	27270276	Spacer
65	27180418	Spring
71	1H048902	Disc motor ass'y
73	27301142	Pulley gear
74	27301143A	Flat wheel
75	27301162	Rubber belt
76	25065322	NMS-1214, Microswitch
77	2000888	Socket ass'y
78	1H048559	NAETC-3359-1, Terminal pc board ass'y
79	27301180	Cushion
81	82143004	3P+4FN(BC), Pan head screw
82	831126060	2.6TTW+6P, Tapping screw
83	838430088	3TTB+8B(BC), Tapping screw
84	834430068	3TTS+6B(BC), Tapping screw
85	834430088	3TTS+8B(BC), Tapping screw
91	28140908	Cushion K
92	28140909	Cushion L
93	28140910	Cushion F
94	27141317	Bracket, switch
95	834440168	4TTS+16B(BC), Tapping screw
96	28140911	Cushion P

DISASSEMBLING PROCEDURES

Top cover

Remove a screw holding the back panel and top cover.
Remove the four screws holding the top cover and chassis.

Main circuit PC board

Remove the top cover.
Remove the eight screws holding the back panel and chassis.
Remove a screw holding the bracket C and opto./digital output PC board.
Remove four screws holding the main PC board and chassis.

Tray panel

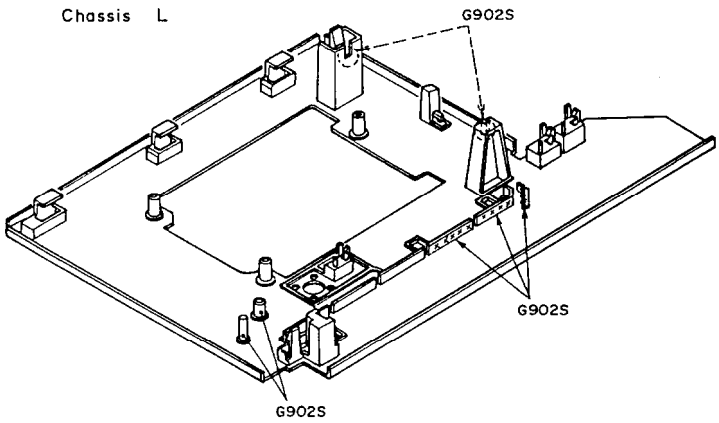
Use a hexagon wrench (2.5mm), remove the two hexagon bolt holding the tray panel and mechanical chassis.

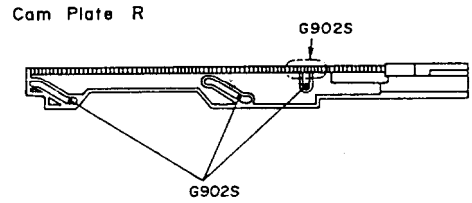
Mechanism ass'y

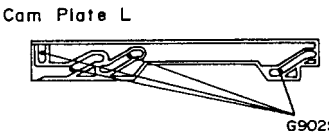
Remove the tray panel.
Remove the four screws holding the mechanism and chassis.

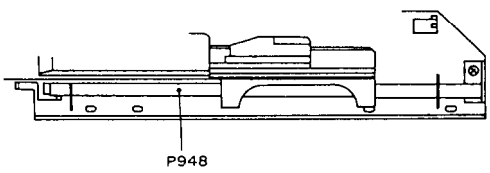
Caution: When disconnect the sockets P101 and P102 on the main circuit PC board, solder the B point on the terminal PC board or the A point on the pickup. (Refer page 6) After remove the flexible PC board of pickup from terminal PC board, remove the terminal PC board.

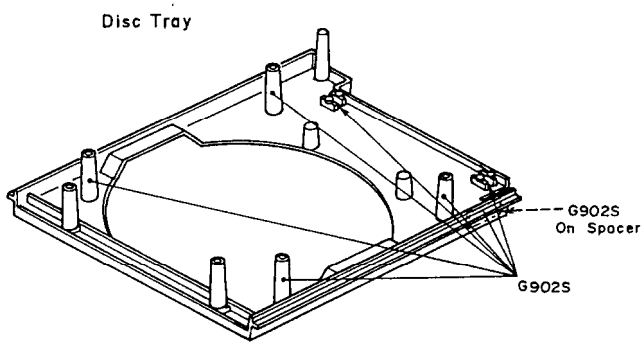
LUBRICATION

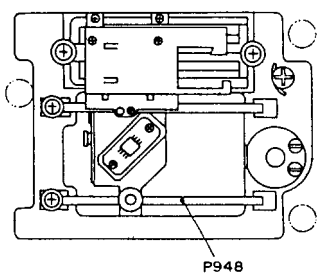












TRAY CLAMPING PROBLEM

CHUCKING ARM ASSY ~~DOESN'T~~ ALWAYS CHUCK FULLY

CHECK TRAY MOTOR, WHEN TRAY MOTOR IS NOT OPERATING MOTOR PINS SHOULD BE EQUAL. SMALL DC ~~OFFSET~~.

IF VOLTAGE AT MOTOR IS UNEQUAL eg MOTOR (+ -) 2.6/.2

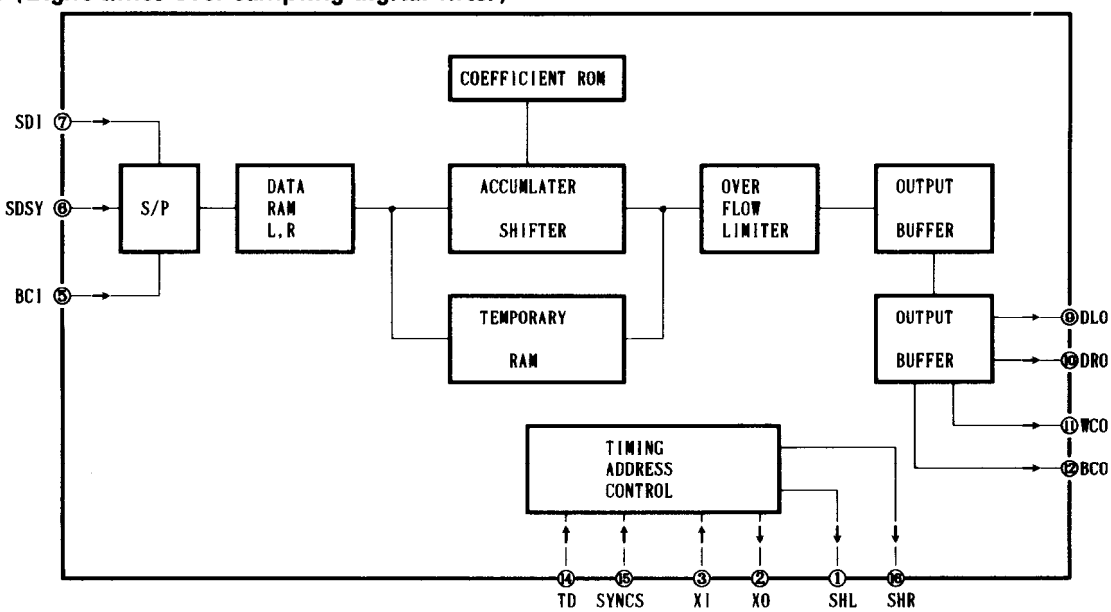
CHECK Q127 AND Q128 IF DEFECTIVE OR MISSING REPLACE WITH CORRECT TRANSISTOR.

1-11-95

8S-3380-1 (DAC unit)

1. VL: Digital section positive power supply
2. DGND: Digital ground
3. PHK: Photo coupler cathode terminal
4. PHA: Photo coupler anode terminal
5. BCLK: Bit clock input terminal
6. WCLK: Word clock input
7. DATA: Data input
8. B4: Bit 4 adjustment terminal
9. B3: Bit 3 adjustment ternimal
10. B2: Bit 2 adjustment terminal
11. B1: MSB adjustment terminal
12. VPOT: Voltage output for bit adjustment
13. VCA: Analog section positive power supply
14. −VCA: Analog section negative power supply
15. SRFL: Servo filter
16. BEFL: Reference voltage filter
17. BPFL: Offset filter
18. SRVI: Super servo input
19. VOUT: DA converter voltage output
20. IOUT: DA converter current output
21. AGND: Analog section ground
22. VCA: Analog section positive power supply
23. V−12: Opto. drive servo amp. output
24. VRO: Opto. drive negative voltage output
25. VR−: Opto. drive servo amp. inversion input
26. −VCA: Analog seciton negative voltage

YM3414 (Eight times over sampling digital filter)



PIN NO.	TERMINAL	I/O	DESCRIPTION
1	SHL	O	When one DAC(TD=L):Deglitching signal of left channel (when four times) When two DAC(TD=H):Deglitching signal of left and right channels(when eight times)
2 3	XO XI	O I	Connect the x'tal oscillator between XI and XO. The clock frequency is 384×Fs.
4	VDD2		+5V:Power supply terminal for x'tal oscillator and deglitching signal.
5 6 7	BCI SDSY SDI	I I I	Bit clock input terminal. Clock shown L/Rch division of input data and input timing. 16 bits serial data input terminal.
8	VDDI		+5V:Power supply terminal for digital signal.
9	DLO	O	When one DAC(TD=L):Output terminal for L/R channel data (When four times) When two DAC(TD=H):Output terminal for L channel data (when eight times)
10 11 12	DRO WCO BCO	O O O	R channel data output terminal. Word clock of output data DLO/DRO. Bit clock of output data.
13	VSS		Ground terminal
14	TD	I	1DAC/2DAC selector terminal: 1DAC at low. 2DAC at high.
15	SYNCS	I	Asynchronous input jitter absorption synchronous signal. Synchronous input at high level. SDSY inhibiting at low level.
16	SHR	O	R channel deglitching signal when one DAC.

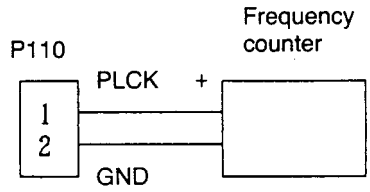
ADJUSTMENT PROCEDURES

Instruments required

Dual trace oscilloscope, Frequency counter, AF oscillator, Test disc (SONY YEDS-18), AC voltmeter, Jitter meter, and Socket P4(Part no. 25050138)

1. VCO frequency adjustment

Connect the frequency counter to terminal P110.
Turn the power switch to ON.(No load the disc.)
Adjust R147 until the frequency counter reading becomes 4322 ±5kHz.
After adjustment, disconnect the frequency counter.



2. Focus offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.
Connect the oscilloscope or jitter meter to terminal P109.
(Oscilloscope)
Adjust R110 until a clear trace of waveform pattern as shown photo 1 appear on the oscilloscope.
When the amount of jitter is broad, set R110 to mechanical center.
(Jitter meter)
Adjust R110 until the jitter meter reading becomes minimum.(Less than 10ns.)
After adjustment, disconnect the oscilloscope or jittter meter.

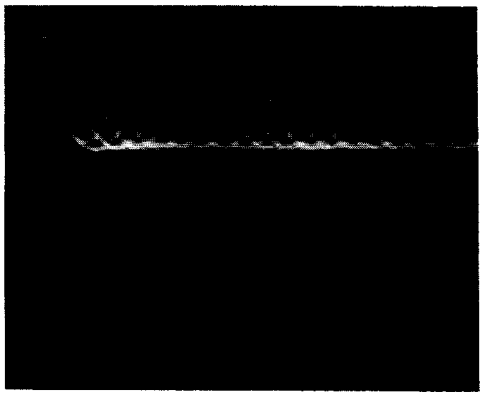
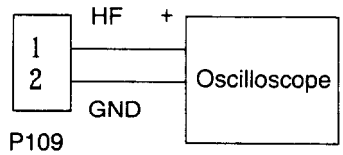
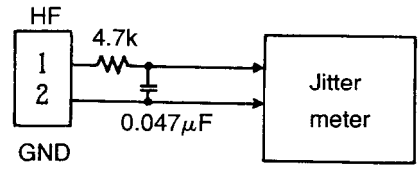


Photo 1



Oscilloscope range
Vertical : 0.5V/div.
Holizontal : 0.2 μs/div.
DC, Ground: Center



3. Tracking offset adjustment

Connect the short clip between TP105 and Ground of digital section.
Turn R125 to minimum position.(Counter clockwise)
Connect the oscilloscope between pin 3 (TR) of P108 and pin 2 (GND) of P109.
Adjust R108 until the center of tracking error signal on the oscilloscope becomes GND level.
Turn R125 to the mechanical center.
After adjustment, disconnect the oscilloscope and short clip.

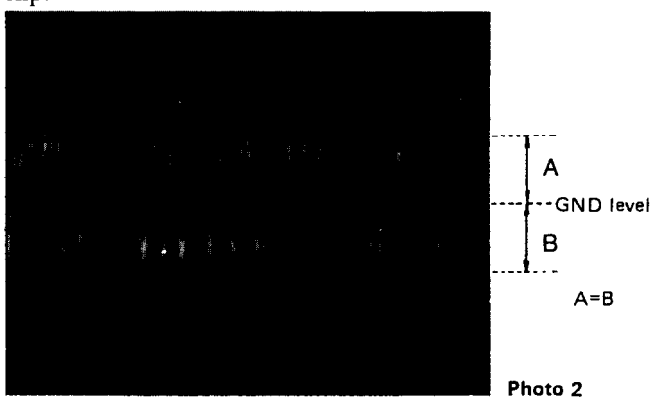
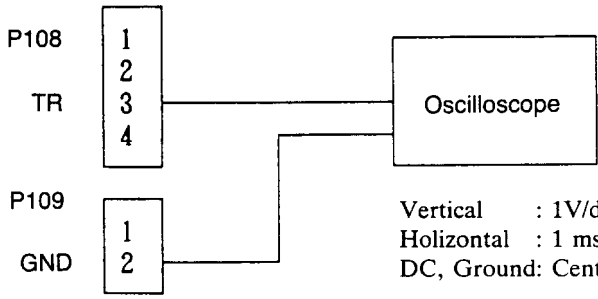


Photo 2



Vertical : 1V/div.
Holizontal : 1 ms/div.
DC, Ground: Center

4. Focus gain adjustment

Set the output of AF oscillator to 800Hz, 1~1.5Vp-p.
Play the track 2 of test disc.
Connect the oscilloscope and the AF oscillator as shown below.

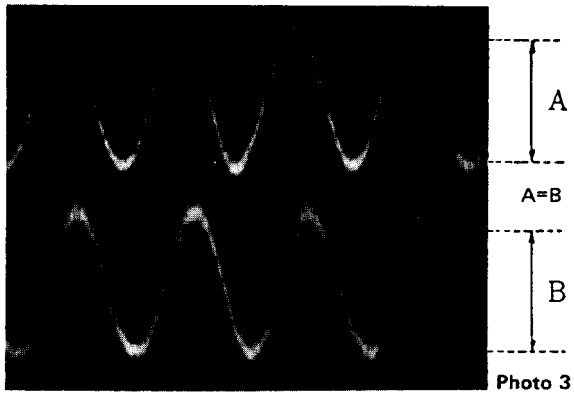
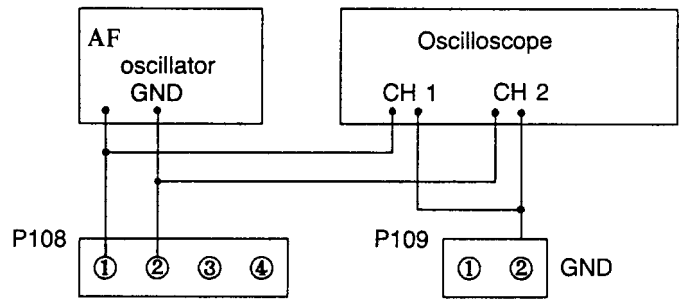


Photo 3



Vertical : 0.5V/div.
Holizontal: 0.5 ms/div.

Adjust R122 until 800Hz components of channels 1 and 2 on oscilloscope become same level.
After adjustment, disconnect the AF oscillator and the oscilloscope.

5. Tracking gain adjustment

Set the output of AF oscillator to 1.2kHz, 1~1.5Vp-p.
Play the track 2 of test disc.
Connect the oscilloscope and the AF oscillator as shown below.

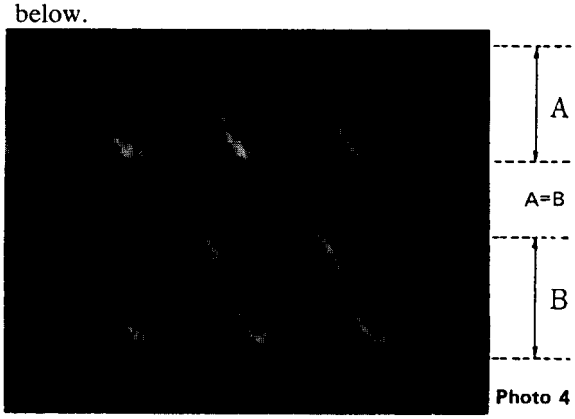
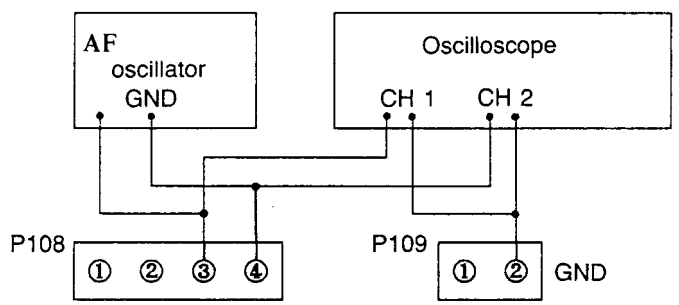


Photo 4



Vertical : 0.5V/div.
Holizontal: 0.2 ms/div.

Adjust R125 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.
After adjustment, disconnect the AF oscillator and the oscilloscope.

6. Opto. transmitter system adjustment

Connect the oscilloscope to test point TP502.
Play the track 2 of test disc.
Adjust R178 until the cross point of data waveform as shown photo 5 becomes on the top side.

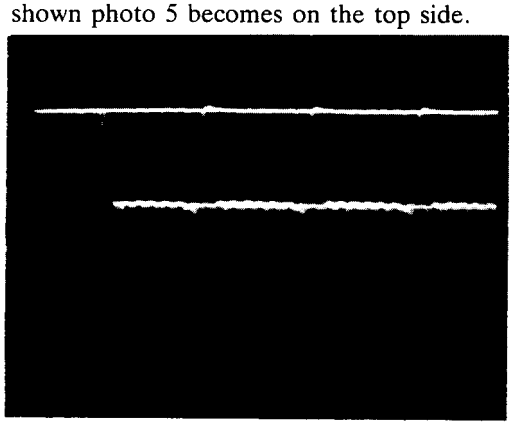
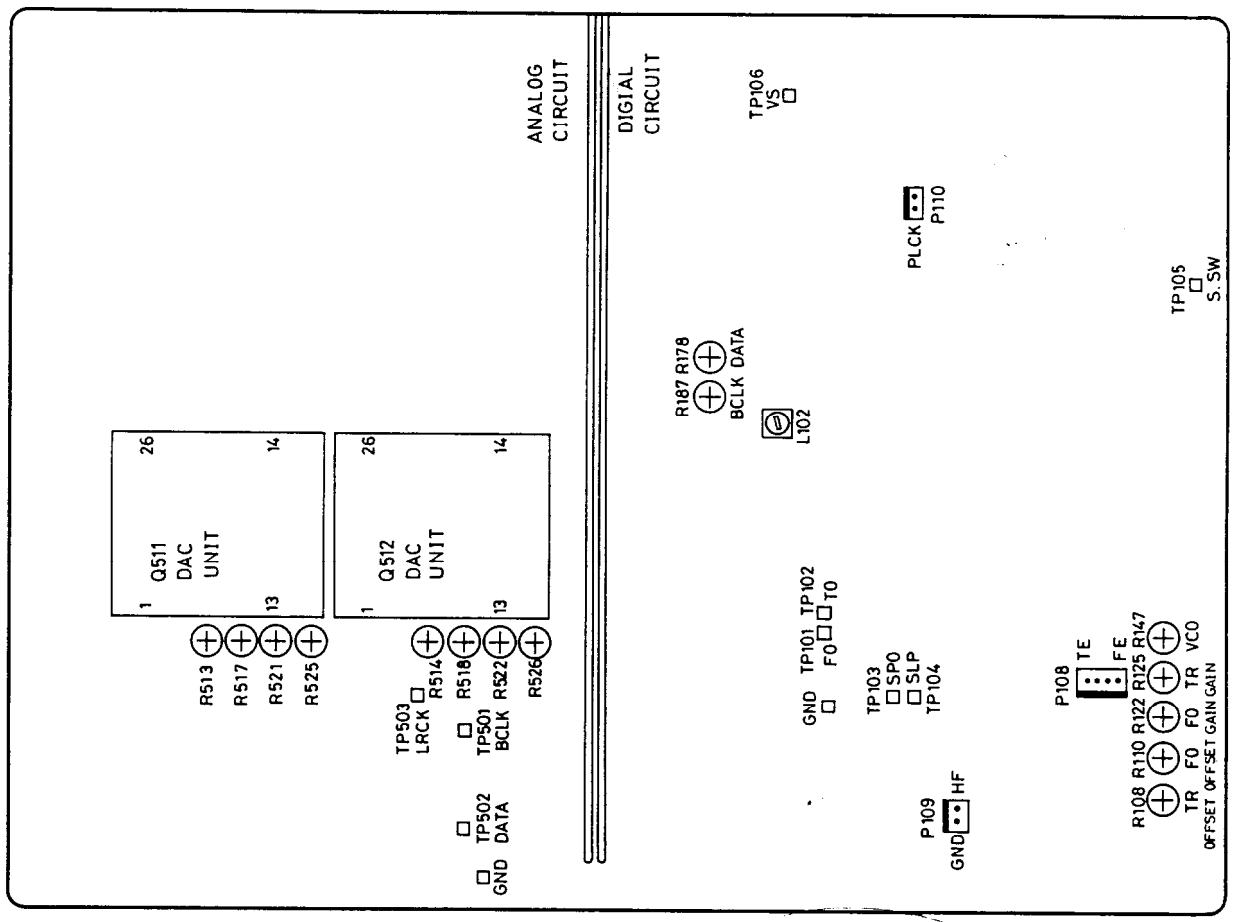


Photo 5

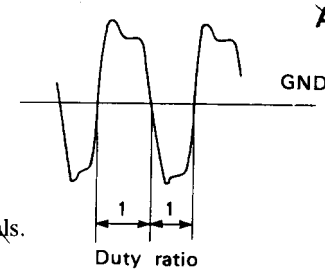
Vertical : 2V/div.
Holizontal : 0.2 μs/div.
DC, Ground: Center



Adjustment Point

7. BCLK adjustment

Connect the oscilloscope to test point TP501.
Play the track 2 of test disc.
Adjust R187 so that the duty ratio of the waveform is 1:1.



8. DA converter adjustment

Connect the distortion analyzer to the audio output (FIXED) terminals.
Play the track 2 of test disc.
Step 1: Adjust R525/R526 so that the distortion analyzer reading is minimum.
Step 2: Adjust R521/R522 so that the distortion analyzer reading is minimum.
Step 3: Adjust R517/R518 so that the distortion analyzer reading is minimum.
Step 4: Adjust R513/R514 so that the distortion analyzer reading is minimum.
Repeat the steps 1, 2, 3 and 4 until no further adjustment is necessary.

PRINTED CIRCUIT BOARD – PARTS LIST

MAIN CIRCUIT PC BOARD (NAAR-3382-1/1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q102	22240180	CXA1081S
Q103	22240018	M51943ASL
Q104	22240181	CXA1082AS
Q107	22240168	STA341M-L
Q108	22240034	LA6510
Q109	22240129	CXD1125QZ
Q110	22240178 or	CXK5816SPS-15L or
	22240118	LC3517AS-15
Q112	22240034	LA6510
Q114	222956	NJM2068DD
Q115	222850381	HD14538BP
Q116	222740745	74HC74P
Q117	222740865	74HC86P
Q118	222755	74HCU04P
Q122	226027	HCPL2601
Q123	222071	HCPL2400
Q501, Q502	22240035	NJM592D8
Q503	22240176	YM3414
Q504	222740745	74HC74P
Q505	222740005	74HC00P
Q511, Q512	222077	8S-3380-1 (DAC unit)
Q515-Q518	22240207	NJM4560SB
Q901	222780052	78M05
Q902	222790053	79L05
Q951	222780155MIT or	M5F78M15L or
	222780154MIT	M5F7815L
Q952	222790155MIT or	M5F79M15L or
	222790154MIT	M5F7915L
Q953	222780052	78M05
Q954	222790083	79L08
Q955	222780053	78L05
	Transistors	
Q101	2211503 or	2SA950-O or
	2211504	2SA950-Y
Q119-Q121	2211254 or	2SC1815-Y or
Q125, Q126	2211255	2SC1815-GR
Q129	221281	DTC114YS
Q513, Q514	2212524 or	2SK363-GR or
	2212525	2SK363-BL
Q903	2211503 or	2SA950-O or
	2211504	2SA950-Y
Q956	2213090	DTA114YS
Q957	2212304 or	2SK381-D or
	2211945	2SK246-GR
Q958, Q959	2211254 or	2SC1815-Y or
	2211255	2SC1815-GR
Q960, Q961	2211454 or	2SA1015-Y or
	2211455	2SA1015-GR
	Diodes	
D101-D103	223163	1SS133
D901	22380018 or	DB103 or
	223892	DF02M
D902, D952	223880 or	GP101N4003 or
D953	223896	1N4003F
D903	224652702 or	HZ27EB2 or
	224452702	MTZ27B
D904	224650511 or	HZ5.1EB1 or
	224450511	MTZ5.1A
D951	22380013	RDF02M
D954, D956	223163	1SS133
D955	224650822 or	HZ8.2EB2 or
	224450822	MTZ8.2B
D958, D959	223163	1SS133

CIRCUIT NO.	PART NO.	DESCRIPTION
	Photo couplers	
Q124	24120002 or	TLP521-2GB or
	24120024	PC827
D104, D106	24120021	FCNE-S-001G
	X'tal	
X101	3010112	KD6586FFB
	Coils	
L101	231023	NCH-1062
L102	232136 or	NSRF-2046 or
	232143	NSRF-2047
	Capacitors	
C101, C102	354721019	100μF, 6.3V, Elect.
C103, C107	371121034	0.01μF±5%, 50V , Mylar
C108	371124724	4700pF±5%, 50V , Mylar
C109	371121034	0.01μF±5%, 50V , Mylar
C110	371122224	2200pF±5%, 50V , Mylar
C111, C112	371121034	0.01μF±5%, 50V , Mylar
C113, C114	354721019	100μF, 6.3V, Elect.
C121	371122224	2200pF±5%, 50V , Mylar
C122	371121044	0.1μF±5%, 50V , Mylar
C123	371122234	0.022μF±5%, 50V , Mylar
C125-C127	371121044	0.1μF±5%, 50V , Mylar
C129	354741009	10μF, 16V, Elect.
C130	371123334	0.033μF±5%, 50V, Mylar
C132	354744709	47μF, 16V, Elect.
C133	354780339	3.3μF, 50V, Elect.
C135	371121034	0.01μF±5%, 50V, Mylar
C136	354780109	1μF, 50V, Elect.
C138	354744709	47μF, 16V, Elect.
C139	354782299	0.22μF, 50V, Elect.
C140	371121034	0.01μF±5%, 50V, Mylar
C142	371121044	0.1μF±5%, 50V, Mylar
C146	354780229	2.2μF, 50V, Elect.
C148	354721019	100μF, 6.3V, Elect.
C149	354781099	0.1μF, 50V, Elect.
C150	371122234	0.022μF±5%, 50V, Mylar
C151	371122224	2200pF±5%, 50V, Mylar
C152, C155	354721019	100μF, 6.3V, Elect.
C162	352942206	22μF, 16V, Non-polar elect.
C166	354744709	47μF, 16V, Elect.
C168-C171	354744709	47μF, 16V, Elect.
C173, C175	354744709	47μF, 16V, Elect.
C177	354744709	47μF, 16V, Elect.
C180	371121034	0.01μF±5%, 50V, Mylar
C501	354744709	47μF, 16V, Elect.
C508	354742209	22μF, 16V, Elect.
C511, C512	354742209	22μF, 16V, Elect.
C517, C518	354742209	22μF, 16V, Elect.
C523, C524	354722219	220μF, 6.3V, Elect.
C525, C526	371121034	0.01μF±5%, 50V , Mylar
C527, C528	391241017	100μF, 16V, Elect.
C529-C532	354742219	220μF, 16V, Elect.
C535, C536	372121514	150pF±5%, 50V, Styrol
C537, C538	373301134	0.01μF±5%, 125V, PP
C539, C540	373302224	2200pF±5%, 125V, PP
C543, C544	373302224	2200pF±5%, 125V, PP
C547, C548	373302224	2200pF±5%, 125V, PP
C551, C552	391242209	22μF, 16V, Elect.
C553-C556	391244707	47μF, 16V, Elect.
C557-C560	391244709	47μF, 16V, Elect.
C563, C564	373303314	330pF±5%, 125V, PP
C565, C566	373301524	1500pF±5%, 125V, PP
C567, C568	373303314	330pF±5%, 125V, PP
C569, C570	371124724	4700pF±5%, 50V, Mylar
C901, C902	352752229	2200μF, 25V, Elect.
C907, C908	354780109	1μF, 50V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C909	354782209	22μF, 50V, Elect.
C910	354762209	22μF, 35V, Elect.
C951, C952	379121035	0.01μF±10%, 50V, Plastic
C953, C954	352753329	3300μF, 25V, Elect.
C955, C956	391242217	220μF, 16V, Elect.
C957	354742219	220μF, 16V, Elect.
C959, C960	354742209	22μF, 16V, Elect.
C961	354721019	100μF, 6.3V, Elect.
C963	354780109	1μF, 50V, Elect.
C964	371124734	0.047μF±5%, 50V, Mylar
C965	354722219	220μF, 6.3V, Elect.
C969	379121045	0.1μF±10%, 50V, Plastic
	Resistors	
R108	5210066	N06HR22KBD, Semi-fixed
R110	5210060	N06HR2.2KBD, Semi-fixed
R122, R125	5210066	N06HR22KBD, Semi-fixed
R147	5210058	N06HR1KBD, Semi-fixed
R178, R187	5210060	N06HR2.2KBD, Semi-fixed
R513, R514	5210070	N06HR100KBD, Semi-fixed
R517, R518	5210070	N06HR100KBD, Semi-fixed
R521, R522	5210070	N06HR100KBD, Semi-fixed
R525, R526	5210070	N06HR100KBD, Semi-fixed
R951	441625604	56ohm, 1/2W, Metal oxide film
R958	431421065	10Mohm, 1/4W, Solid
R963	442521214	120ohm, 1/2W, Metal oxide film
	Plugs	
P101	25055136	NPLG-6P120
P102	25055139	NPLG-9P123
P103	25055154	NPLG-10P138
P104	25055157	NPLG-13P141
P105	25055190	NPLG-9P174
P106	25055146	NPLG-2P130
P107	25055150	NPLG-6P134
P108	25055045	NPLG-4P33
P109, P110	25055038	NPLG-2P29
P402	25055152	NPLG-8P136
	Terminal	
P401	25045240	NPJ-6PDBL114
	Radiators	
	27160176	RAD56
	27160220	RAD51(B)
	Socket	
SC501	2000939	NSAS-2P891
	Relaies	
RL101, RL102	25065174	NRL-2P1A-DC1209
	Fuses	
QF101, QF102	252112	ICPN15, IC protector ⟨G⟩

NOTE:⟨G⟩: Except 120V model

OPTO./DIGITAL OUTPUT PC BOARD (NADG-3383-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q191	24120014	DF-1111/T, Photo coupler
P191	25045239	NPJ-1PORG-113, Terminal, Opto. output
P192	25045172	HSJ1003-01-020, Terminal RI
SC191	2000929	NSAS-12P882, Socket

TERMINAL PC BOARD(NAETC-3359-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P001	25050361	NSCT-18P188, Socket
SC001	2000890	NSAS-12P846, Socket
SC002	2000873	NSAS-18P829, Socket

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

DISPLAY CIRCUIT PC BOARD(NADIS-3365-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q701	22240179	CXP5058H-104QZ
Q703	22240173	LC6527H-3722
Q707	222963	LB1630
	Fluorescent tube	
Q702	212059	16BT-09GK
	Transistors	
Q704, Q705	2212600	DTA124ES
Q706	2212132 or	2SC2021-R or
	2212133	2SC2021-S
	Diodes	
D701-D704	223163	1SS133
D705	224650562 or	HZ5.6EB2 or
	224450562	MTZ5.6B
	Capacitors	
C701, C703	354721019	100μF, 6.3V, Elect.
	Resistors	
R735-R742	49163472408	4.7kohm×8, 1/10W, Network
	Switches	
S701-S736	25035548	NPS-111-S510
	Sockets	
SC701	2000891	NSAS-26P847
SC702	2000883	NSAS-18P839
SC703	2000732	NSAS-4P688
SC704	2000755	NSAS-4P711
SC705	2000892	NSAS-12P848
	Holder	
	27190656A	Display

POWER SWITCH PC BOARD(NAPS-3366-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
C941	3500065A	⚠ DE7150FZ103PCSA, Capacitor IS
P941	25035558	⚠ NPS-111-L520P, Power switch

HEADPHONE AMPLIFIER PC BOARD(NAAF-3367-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q451	222887	NJM4556S, IC
Q453, Q454	2211705 or	2SD655-E or
	2211706	2SD655-F, Transistors
C453, C454	354742219	220μF, 16V, Elect. capacitors
C455, C456	371122224	2200pF±5%, 50V, Mylar capacitors
C457, C458	354744709	47μF, 16V, Elect. capacitors
R451	5104242	N16RGM20KB30F, Variable resistor
R463, R464	442521014	100ohm, 1/2W, Metal oxide film resistors
P451	25055183	NPLG-2P167, Plug
SC451	2000917	NSAS-16P870, Socket

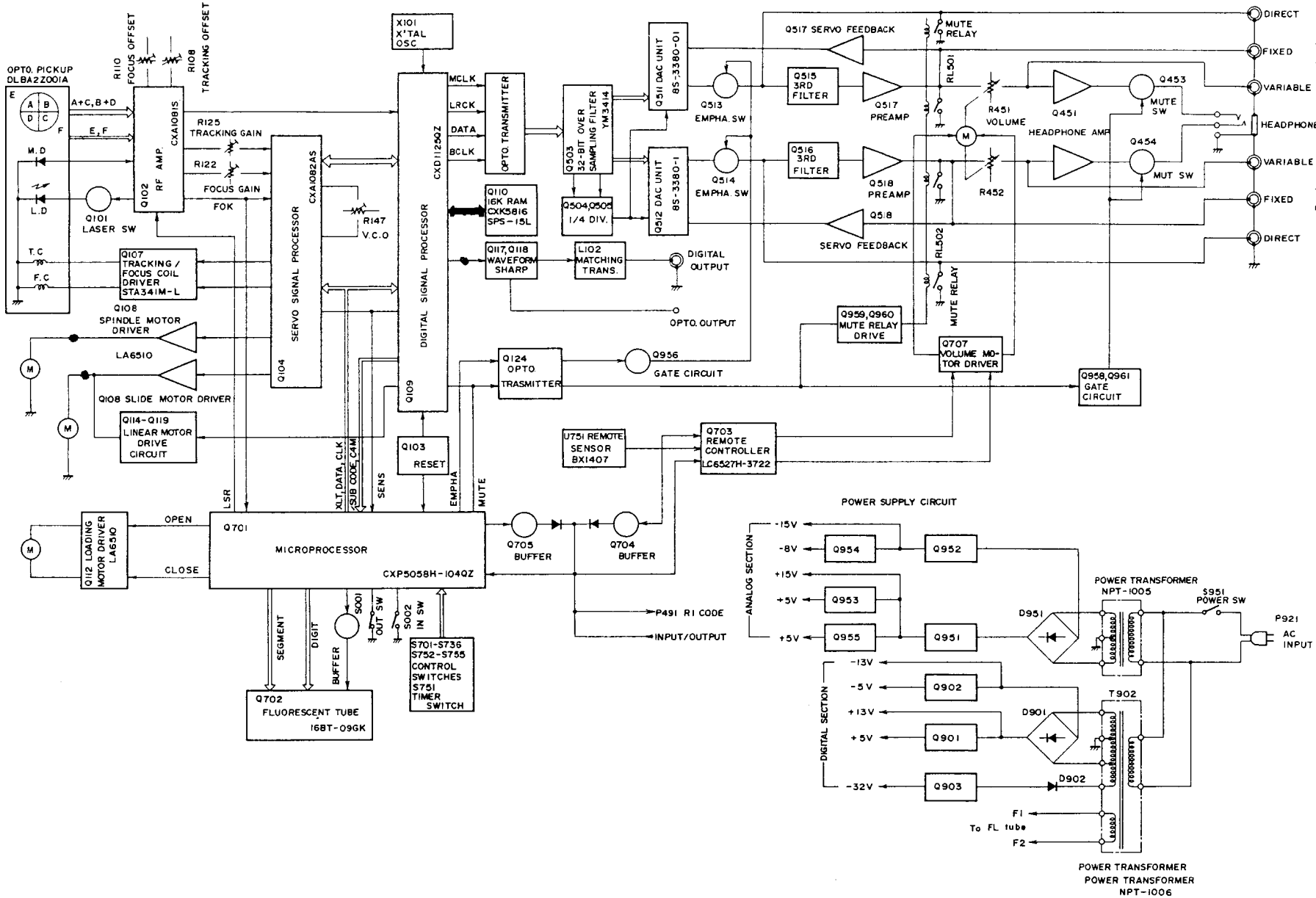
HEADPHONE TERMINAL PC BOARD(NAAF-3368-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
P491	25045139	HLJ0540-01-010, Headphone terminal

SWITCH PC BOARD(NASW-3369-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
U751	241068	BX-1407, IC
D751, D752	225142	SEL2913K, LEDs
C751	354721019	100μF, 6.3V, Elect. capacitor
S751	25065325	NSS-23128, Slide switch
S752-S755	25035548	NPS-111-S510, Push switches
P701	25055187	NPLG-6P171, Plug
	27190499A	Holder

BLOCK DIAGRAM



DX-7500